



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 09/802,289 | 03/08/2001 | Ashley Saulsbury | 16747-010010US | 6888 |
| 20350 | 7590 | 09/21/2004 | EXAMINER | |
| TOWNSEND AND TOWNSEND AND CREW, LLP TWO EMBARCADERO CENTER EIGHTH FLOOR SAN FRANCISCO, CA 94111-3834 | | | | TSAI, HENRY |
| | | ART UNIT | | PAPER NUMBER |
| | | 2183 | | |

DATE MAILED: 09/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PL

| | | |
|------------------------------|-----------------|------------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 09/802,289 | SAULSBURY ET AL. |
| | Examiner | Art Unit |
| | Henry W.H. Tsai | 2183 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 21 July 2004.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-16 and 18-20 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-16 and 18-20 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 21 July 2004 is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date, _____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____. | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____. |

DETAILED ACTION

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969). A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b). Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1, 7, 11, 13, 14, 17, and 18 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 19, and

24-27 of copending Application No. 09/802,120. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 19, and 24-27 of copending Application No. 09/802,120 contain(s) every element of claims 1, 7, 11, 13, 14, 17, and 18 of the instant Application and as such anticipate(s) claims 1, 7, 11, 13, 14, 17, and 18 of the instant Application. Note the limitations in claim 19 of Application No. 09/802,120 amended 9/13/04, "where one of the Q-number of register comprises a program counter register that holds a current program counter value" does not provide any further patentable weights to the claimed invention because a program counter register that holds a current program counter value is an inherent circuit in a processor (see U.S. Patent No. 5,553,095 to Engdahl et al.).

"A later patent claim is not patentably distinct from an earlier patent claim if the later claim is obvious over, or anticipated by, the earlier claim. In re Longi, 759 F.2d at 896, 225 USPQ at 651 (affirming a holding of obviousness-type double patenting because the claims at issue were obvious over claims in four prior art patents); In re Berg, 140 F.3d at 1437, 46 USPQ2d at 1233 (Fed. Cir. 1998) (affirming a holding of obviousness-type double patenting where a patent application claim to a genus is anticipated by a patent claim to a species within that genus). "ELI LILLY AND COMPANY v BARR LABORATORIES, INC., United States Court of Appeals for the Federal Circuit, ON PETITION FOR REHEARING EN BANC (DECIDED: May 30, 2001).

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 3, 5, 6, 8-11, 13, 15, 16, 19, and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Drabenstott et al. (U.S. Patent No. 6,366,999), hereafter referred to as Drabenstott et al.'999.

Referring to claim 1, Drabenstott et al.'999 discloses, as claimed, a processing core (processing elements: PE1, PE2, and PE3 see Fig. 1) comprising: one or more processing pipelines having a total of N-number of processing paths (N=4 for the

Drabenstott et al.'s system shown in Fig. 1), each of said processing paths for processing instructions on M-bit data words (the data can be either 32 or 64 bits, see the 32-bit data bus 126 as shown in Fig. 1, and Col. 2, line 43 regarding 64-bit data types); and a plurality of register files (PE CONFIG REGISTER FILES, 127, see Fig. 1), each having Q-number of registers (note Drabenstott et al.'s register files (PE CONFIG REGISTER FILES, 127, see Fig. 1) inherently comprises Q register each), said Q-number of registers being M-bits wide; wherein said Q-number of registers within each of said plurality of register files (PE CONFIG REGISTER FILES, 127, see Fig. 1) are either private or global registers, and wherein when a value (the data value such as in BCAST DATA BUS 126, see Col. 6, lines 34-36) is written to one of said Q-number of said registers which is a global register within one of said plurality of register files, said value is propagated to a corresponding global register in the other of said plurality of register files (since the data is broadcasted data in the BCAST DATA BUS 126, see Fig. 1. Further see the broadcast DATA BUS 126 is clearly connected from PE CONFIG REGISTER FILES, 127, to the corresponding global register, PE CONFIG REGISTER FILES, in PE1, PE2 and PE3, see Fig. 1), and wherein when a value (the data value exchanged between the PE register files 127 see Fig. 1) is

written to one of said Q-number of said registers which is a private register (since the data value are only exchanged between the PE register files 127 see Fig. 1) within one of said plurality of register files (PE CONFIG REGISTER FILES, 127, see Fig. 1), said value is not propagated to a corresponding register in the other of said plurality of register files.

Referring to claim 10, Drabenstott et al.'999 discloses, as claimed, a VLIW processing core (processing elements: PE0, PE1, PE2, and PE3 see Fig. 1) comprising: one or more processing pipelines each including a fetch stage (using I-fetch unit 103, see Fig. 1), a decode stage (inherent stage in a pipeline), an execute stage (using execution units, MAU, ALU, DSU, STORE, and LOAD see Fig. 1), and a write-back stage (inherent stage in a pipeline), said execute stage having an execute unit comprising an integer processing unit (such as MAU, or ALU see Fig. 1 when input data are integer), a load/store processing unit (such as STORE, and LOAD see Fig. 1), a floating point processing unit (such as MAU, or ALU see Fig. 1 when input data are floating point), or any combination of one or more of said integer processing units, said load/store processing units, and said floating point processing units; and a register file (PE CONFIG REGISTER FILES, 127, see Fig. 1) for each of said one or more processing pipelines (note as shown in Fig. 1, each pipeline has

one register file 127, see Fig. 1); wherein an integer processing unit and a floating point processing unit within said one or more processing pipelines both access said register file (PE CONFIG REGISTER FILES, 127, see Fig. 1), the register file is comprised of Q-number of registers (PE CONFIG REGISTER FILES, 127, see Fig. 1), said Q-number of registers (PE CONFIG REGISTER FILES, 127, see Fig. 1) are either private or global registers, when a value (the data value such as in BCAST DATA BUS 126, see Col. 6, lines 34-36) is written to one of said Q-number of said registers which is a global register within one of said plurality of register files, said value is propagated to a corresponding global register in another register files (since the data is broadcasted data in the BCAST DATA BUS 126, see Fig. 1) within the VLIW processing core (processing elements: PE0, PE1, PE2, and PE3 see Fig. 1), when a value (the data value exchanged between the PE register files 127 see Fig. 1) is written to one of said Q-number of said registers which is a private register (since the data value are only exchanged between the PE register files 127 see Fig. 1) within one of said plurality of register files (PE CONFIG REGISTER FILES, 127, see Fig. 1), said value is not propagated to a corresponding register in another register file within VLIW processing core (processing elements: PE0, PE1, PE2, and PE3 see Fig. 1). Note

Art Unit: 2183

Drabenstott et al. also discloses the limitations of claims 5, 15, 6, and 16 as set forth above in claim 10 wherein N-number (N=4 for the Drabenstott et al.'s system shown in Fig. 1), and M-bit data words (the data can be either 32 or 64 bits, see the 32-bit data bus 126 as shown in Fig. 1, and Col. 2, line 43 regarding 64-bit data types) are set forth above.

Referring to claim 11, Drabenstott et al. discloses, as claimed, in a computer system, a scalable computer processing architecture, comprising: one or more processor chips (see Fig. 1), each comprising: a processing core (processing elements: PE1, PE2, and PE3 see Fig. 1), including: a processing pipeline having N-number (N=4 in Fig. 1) of processing paths, each of said processing paths for processing instructions on M-bit data word (the data can be either 32 or 64 bits, see the 32-bit data bus 126 as shown in Fig. 1, and Col. 2, line 43 regarding 64-bit data types); and one or more register files (PE CONFIG REGISTER FILES, 127, see Fig. 1), each having Q-number of registers (note Q is a variant. Drabenstott et al.'s VLIW is inherently having Q number), said Q-number of registers being M-bits wide; an I/O link (PE local memory & data bus interface, 157, 157', 157'', see Fig. 1) configured to communicate with other of said one or more processor chips or with I/O devices (since the processor, as shown in Figs. 1 and 5B, is a VLIW-based processor, see also

Col. 6, lines 12-15, regarding "SP/PE0 and the other PEs use a five instruction slot ivLIW architecture which contains a very long instruction word memory (VIM) 109"; a communication controller (cluster switch 171 see Fig. 1, and Col. 6, lines 43-44) in electrical communication with said processing core and said I/O link (PE local memory & data bus interface, 157, 157', 157', see Fig. 1); said communication controller (cluster switch 171 see Fig. 1, and Col. 6, lines 43-44) for controlling the exchange of data between a first one (such as that comprising PE1) of said one or more processor chips (comprising processing elements: PE1, PE2, and PE3 see Fig. 1) and said other (such as that comprising PE2) of said one or more processor chips (comprising processing elements: PE1, PE2, and PE3 see Fig. 1 see Fig. 1); wherein said computer processing architecture can be scaled larger by connecting together two or more of said processor chips in parallel via said I/O links (PE local memory & data bus interface, 157, 157', 157', see Fig. 1) of said processor chips, so as to create multiple processing core (processing elements: PE1, PE2, and PE3 see Fig. 1) pipelines which share data therebetween, said Q-number of registers within each of said plurality of register files (PE CONFIG REGISTER FILES, 127, see Fig. 1) are either private or global registers, when a value (the data value such as in BCAST DATA BUS 126, see

Col. 6, lines 34-36) is written to one of said Q-number of said registers which is a global register within one of said plurality of register files, said value is propagated to a corresponding global register in the other of said plurality of register files (since the data is broadcasted data in the BCAST DATA BUS 126, see Fig. 1), and wherein when a value (the data value exchanged between the PE register files 127 see Fig. 1) is written to one of said Q-number of said registers which is a private register (since the data value are only exchanged between the PE register files 127 see Fig. 1) within one of said plurality of register files (PE CONFIG REGISTER FILES, 127, see Fig. 1), said value is not propagated to a corresponding register in the other of said plurality of register files.

As to claims 3 and 13, Drabenstott et al. also discloses: a processing instruction comprises N-number of P-bit instructions (p=32, i.e. the instructions comprise 32 bits, see Fig. 4A-4C) appended together to form a very long instruction word (VLIW) (as set forth above, since the processor, as shown in Figs. 1 and 5B, is a VLIW-based processor, see also Col. 6, lines 12-15, regarding "SP/PE0 and the other PEs use a five instruction slot iVLIW architecture which contains a very long instruction word memory (VIM) 109"), and said N-number of processing paths process N number of P-bit instructions in parallel (note the

above N, P, and M are variant. Drabenstott et al.'s VLIW is inherently having N, P, and M bit number).

As to claims 8 and 19, Drabenstott et al.'999 also discloses: each of said plurality of register files (PE CONFIG REGISTER FILES, 127, see Fig. 1) is connected to a bus (BCAST DATA BUS 126, see Col. 6, lines 34-36), and a value written to a global register in one of said plurality of register files is propagated to a corresponding global register in the other of said plurality of register files across said bus.

As to claims 9 and 20, Drabenstott et al.'999 also discloses: said plurality of register files (PE CONFIG REGISTER FILES, 127, see Fig. 1) are connected together in serial, and a value written to a first global register in a first of said plurality of register files is propagated to a corresponding first global register (note the number of the register could be broadly defined since it was not well defined previously) in a second of said plurality of register files connected directly to said first of said plurality of register files (PE CONFIG REGISTER FILES, 127, see Fig. 1).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 2 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Drabenstott et al.'999 in view of Masubuchi (USP 5,530,817), hereafter referred to as Masubuchi'817.

Drabenstott et al.'999 discloses the claimed invention except for: every two of said N number of processing paths share one of said plurality of register files.

Masubuchi'817 discloses a VLIW computer comprising: every two of said N number of processing paths (for ALUs 13 and 14, see Fig. 1) share one (register file 12, see Fig. 1) of said plurality of register files (register files 12 and 22, see Fig. 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Drabenstott et al.'999's system to comprise every two of said N number of processing paths share one of said plurality of register files, as taught by Masubuchi'817, in order to reduce the number of register files in the Drabenstott et al.'999's system.

7. Claims 4 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Drabenstott et al.'999 in view of Ito et al. (U.S. Patent No. 6,615,339), hereafter referred to as Ito et al.'339.

Drabenstott et al.'999 discloses the claimed invention comprising N=4, M=64, and P=32, as set forth above, except for explicitly showing: using Q=64 registers in the register file.

Ito et al.'339 discloses a system comprising Q=64 registers (R0, R1, ..., R63, see Fig. 4A) in the register file (40, see Fig. 4A).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Drabenstott et al.'999's system to comprise having Q=64 registers in the register file, as taught by Ito et al.'339, in order to increase the speed of data movement by using register to register data reference for the Drabenstott et al.'999's system.

Further, as shown in re Rose, 105 USPQ 237 (CCPA 1955), to make changes in size/range generally does not provide patentable weight to the claimed invention.

Response to Amendment

8. Applicant's arguments filed 7/21/04 have been fully considered but they are not deemed to be persuasive.

Applicant argues that in reference of Drabenstott et al., it does not make clear that the register file content are broadcasted on the bus 126 (page 13, lines 15-17). Examiner disagrees with Applicant. As set forth above, said Q-number of registers within each of said plurality of register files (PE CONFIG REGISTER FILES, 127, see Fig. 1) are either private or global registers, and wherein when a value (the data value such as in BCAST DATA BUS 126, see Col. 6, lines 34-36) is written to one of said Q-number of said registers which is a global register within one of said plurality of register files, said value is propagated to a corresponding global register in the other of said plurality of register files (since the data is broadcasted data in the BCAST DATA BUS 126, see Fig. 1. Further see the broadcast DATA BUS 126 is **clearly connected from PE**

CONFIG REGISTER FILES, 127, to the corresponding global register, PE CONFIG REGISTER FILES, in PE1, PE2 and PE3, see Fig. 1).

Applicant argues that there is no indication of global and private registers as required by the claims in their current form or the concepts in the dependent claims. Examiner disagrees with Applicant. As described in the independent claims 1, 10, and 11, the Q-number of registers within each of said plurality of register files are either private "or" global registers. Global "and" private registers are required by the claims.

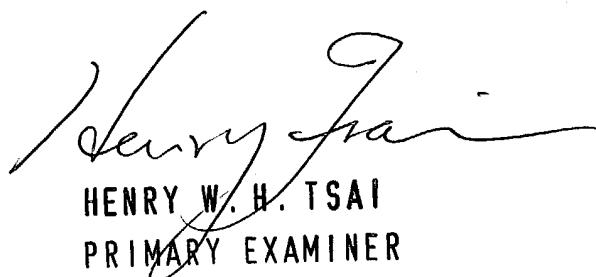
Contact Information

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Henry Tsai whose telephone number is (703) 308-7600. The examiner can normally be reached on Monday-Thursday from 8:00 AM to 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner supervisor, Eddie Chan, can be reached on (703) 305-9712. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to

the TC 2100 receptionist whose telephone number is (703) 305-3900.

10. In order to reduce pendency and avoid potential delays, Group 2100 is encouraging FAXing of responses to Office actions directly into **the Group at fax number: 703-872-9306**

This practice may be used for filing papers not requiring a fee. It may also be used for filing papers which require a fee by applicants who authorize charges to a PTO deposit account. Please identify the examiner and art unit at the top of your cover sheet. Papers submitted via FAX into Group 2100 will be promptly forward to the examiner.



HENRY W. H. TSAI
PRIMARY EXAMINER

September 14, 2004